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# MILITARY & CIVILIAN DENTAL EDUCATION & PRACTICE IN GERMANY.

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Military and Civilian Dental  
Education and Practice  
in Germany.

Reported by

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### I. Dental Education and Practice.

This section is based on an investigation of the Dental School of the University of Marburg. Prof. Dr. Hans Heuser, assistant director, is now in charge of the dental school in the absence of Prof. Dr. Fliege who is being held for Nazi activities. Dr. Heuser was professor of operative dentistry. Dr. Fliege was professor of surgery, and a Prof. Kunzendorf taught prosthetics. The school was not a large one, varying from 200 students in 1934 to about 100 in 1938, a number maintained though the war. The school is undamaged and could function at once if permission were granted.

Enrollment was at a maximum from 1922 to 1934, falling off nearly fifty per cent after that date. This has been found to be the case with most schools in Germany. The cause is said to be that men whose schooling had been interrupted during World War I were anxious to complete it afterwards, and there were not enough dentists in Germany at that time. By 1934 there were fewer openings in the socialized dentistry system and new graduates could seldom count on making a living in private practice alone. It is not felt that low fees in the socialized dental system were primarily to blame as these fees were in effect at the time of greatest enrollment.

After 1934, women made up at least forty per cent of the students at this school and made up fifty per cent of the student body at the outbreak of World War II. At the outbreak of hostilities all physically qualified men were taken from school, leaving about fifty women and a very few physically disqualified males. In 1940 the dental school in Frankfurt was damaged and all students went to Marburg for the winter semester only, returning to Frankfurt for the summer semester of 1941. From 1941 to 1943 the school averaged about fifty students, mainly women. From 1943 to 1945 the enrollment was increased to about 90 or 100 by addition of some forty to fifty men, one third of whom were from the Wehrmacht and two thirds were disabled veterans. Women still remained in the majority. Women appear to like dentistry and do well in school clinics. Dr. Heuser thinks men do better in general practice.

The course of study was similar to that in all other schools in Germany and required three and one-half years for graduation, with an extra half year if the degree of "Dr." was desired. Most students here completed four years. (See report on dental education for details of course.) Dr. Heuser felt that the war had not interferred greatly with instruction at Marburg. Military students devoted one afternoon weekly to military duties. The Nazi regime had not interferred with the operation of the school, although Dr. Heuser said that

Dr. Fliege would probably not have been made director if he had not been active politically. The director of the dental school of the University of Giessen was said to have been appointed in 1942 largely for political reasons. After 1934, no Jewish students were enrolled, as was the case throughout Germany.

No qualified students were refused enrollment, but lack of opportunity after graduation kept the total low.

Dr. Heuser believes the three and one-half year course is too short and recommends at least one more year, with increased time to devote to general medical background.

#### DENTAL RESEARCH

Very little important research appears to have been carried on at this school before or during the war. Dr. Fliege did some work on conservation of teeth with fractured roots, also on the local effect of anesthetics on tissues. Dr. Heuser did work on the relation of the floor of the maxillary sinus to the roots of the teeth.

Dr. Heuser mentioned the existence of a group for caries research, formed about 1934. To date no definite results have been achieved so far as Dr. Heuser knew. Dr. Euler of Breslau was the most important member. Dr. Euler's work consisted primarily of studies of skeletons from various periods in German history. From these studies he concluded that the introduction of highly refined foods from France in the 1600's was followed by an increase in caries. Also that those people eating simpler food (Poles and Prussians) had better teeth. Dr. Euler was thought to have done work on nutrition in relation to caries, but results were not known to Dr. Heuser. Prof. Goeth, also of Breslau was Dr. Euler's assistant.

Preventive dentistry, as taught at Marburg, was based on personal oral hygiene and early treatment. Calcium salts were recommended, as were vitamins C and D, but not too much was expected from their use.

Dr. Heuser, whose primary interest is in roentgenography, made a study of periodontoclasia in which he came to the not very startling conclusion that there are three factors involved: 1. Local (calculus); 2. Traumatic occlusion; 3. Systemic factors (endocrine deficiencies.)

What part each played, and the differential diagnosis in any given case was not determined, though Dr. Heuser believed that in almost all cases a systemic factor was present. This conclusion was based on radiographic observation of moderate pockets in mouths without symptomatic periodontoclasia. In spite of the belief in a systemic background, treatment was largely local (scaling, equalization of occlusion, gingivectomy in advanced cases).

In Germany, very little practice is done on a straight fee basis. Roughly two-thirds of all dental treatment is done under the state insurance or "Krankenkasse" system in which the worker contributes one-third of a monthly fee and the employer two-thirds for insurance covering himself and family. Dental attention is limited to essential procedures with cheapest materials provided. About one-third, for persons not eligible for state insurance or for those desiring better treatment, is handled by private insurance systems. These systems may provide very cheap or very elaborate service and fees therefore vary in different organizations. Dr. Heuser thinks that state insurance system pays so little that dentists must handle too many cases. Men dependent on this type of work often work a crowded nine hour day to make a living. He thinks that if the dentist can combine the state insurance practice, with a private practice, as is legal, it is not too bad. Service rendered is not good, but it probably the best the laborer can afford. All patients who can afford it belong to private insurance groups. In a previous interview it had been stated that the state insurance system paid a sliding scale of fees by which the dentist received less for all treatments rendered in any month over a set maximum. This scheme was said to prevent a dentist from attempting to handle too many patients. This conception was not accurate, however, and was based probably on the following facts:

a. Fees paid dentists in any month depend upon income to the insurance system for that month. Thus a great increase in treatments given, without an increase in premiums paid in, would result in a lower fee per patient.

b. The national dental society, under control of the state, could adjust fees paid to dentists in a given locality on the basis of personal need or political reliability. Thus a bachelor doing a good practice might have his income reduced and the difference given to a less successful colleague with a large family.

Disputes regarding treatment or fees, which were infrequent, were settled at the Landestelle (headquarters) of the Kassenzahnärztliche Vereinigung Deutschlands.

#### MISCELLANEOUS

Acrylic resins are used for bridges and for inlays and crowns for front teeth, but they are not used for posterior fillings.

The "provocation" method of irritating a suspected tooth by diathermy or vibration in the hope that it will reveal itself as a source of infection by (a) developing an acute abscess or (b) causing an acute exacerbation of a systemic disease, is practiced but with misgivings. Blood sedimentation tests in cases with suspected foci are sometimes called for by other clinics, but are not considered reliable by the dental department. The diseases believed due to focal infection are about as taught in the US, except that emphasis is

placed on bacterium and endocarditis, the case for the latter disease being usually considered not proven in the US. Dr. Kehlfelder of Frankfurt and Giessen claims to sterilize and break up granulomata with x-ray treatment (as previously reported by Dr. Klughardt of Jena). Letod proved unsuccessful when tried at Marburg.

## II. Military Dentistry.

The subject of German military Dentistry was investigated at a POW hospital located at Marburg. This hospital, under control of the 10th POW hospital at Marburg treats German military patients. It is not a maxillo-facial center though some work of this nature is done by Oberfeldarzt (Z) Gottlob Alfken, Dental Officer. Bone grafting is referred to Prof. Dr. Wiedhopf of the Philips University.

When first seen, Dr. Alfken was preparing to do an apicoectomy. Doctor and nurses scrubbed carefully though no gloves or masks were used. Patient was draped and instruments handled under aseptic conditions. The field was dried and iodine applied, but debris was washed out with saline solution and the patient allowed to spit frequently. The field was also irrigated with "perhydrit" solution of hydrogen peroxide derived from tablets dissolved in water which seemed to liberate oxygen freely. In all other respects a standard operation was performed.

At a later appointment Dr. Alfken was interviewed at length, in the presence of the German commander of the hospital. For convenience his remarks will be reported under general subject headings.

### MILITARY DENTISTRY

Before the war there was no dental corps in the German Army, based on the reasoning that in a short blitzkrieg, no dentists would be needed. Prominent dentists tried to have a dental corps authorized, but without success. There was also no dental corps reserve, and no definite plan for including a dental corps in the regular army after the war, although such a plan was discussed and advocated. Medical officers for the Wehrmacht were educated at government expense at the Military Medical Academy in Berlin, but no dentists were so educated.

Soon after mobilization in 1939 dentists already in the Wehrmacht as line troops, or entering later, were given a non-commissioned rating (Kriegszahnarzt) somewhat similar to that of contract surgeon. They wore the uniform of officers and were given the relative rank and pay of Major or Lieutenant Colonel, depending on age and professional standing. In this situation they were not part of the Sanitäts

Korps and functioned directly under the Sanitäts Inspekteur of the Wehrmacht in professional matters, and under local commanding officers for administration.

Early in 1943 dentists were made part of the Sanitäts Korps and were simultaneously reduced in grade to that held before creation of the "Kriegszahnarzt" grade. As many of them had been privates or non-commissioned officers in line units, they reverted to these grades. New graduates from the schools also entered the army thereafter as privates in line units. These dentists in grade of private were given the grade of "Unteroffizier" about eight weeks. They were then ineligible for further promotion until they had served at least six months at the front, when they could be promoted to "Unterarzt" or third lieutenant. New dentists entering the army went through all non-commissioned grades, though more rapidly than line troops. After arriving at commissioned grade, the dentist could reach the grade of colonel. Promotion was based principally on seniority, though exceptions were made to promote outstanding men ahead of their relative positions. Such promotions were handled by a central office (military personnel) of the Wehrmacht and were made to fill vacancies. Promotions were based on vacancies in the army as a whole and not in the dentist's own organization. Thus the officer might be promoted while holding a minor position in his own unit. Men generally were shifted sooner or later, however, so that important positions were held by higher grades. (Other dental officers interviewed did not feel that seniority was very closely adhered to in making promotions. All agreed that promotion could be made out of turn, some believing that the system closely approached the so-called "merit system".) Promotion in the lower grades was fairly rapid, occurring at intervals of six months to a year. In higher grades it was slower, occurring at intervals of one to two years. (These figures are obviously estimates, just as no exact answer could be given to the question of "how long does it take to go from Captain to Major in the American Army?") Toward the end of the war the requirement that a dentist have battle front service before commissioning relaxed.

Selected enlisted men from line units who were usually former dental students, were returned to dental schools after six months in line service. They were given non-commissioned grades and received pay and allowances, but school expenses were paid by the student.

It was stated by both the dentist and doctor present that no dentists were assigned to line units in the German Army, but always were assigned to hospitals. This information does not agree with that from other sources and is not believed reliable.

"Dentisten" (dental technicians) were not taken into the army dental corps, but in some cases obtained equipment and operated informally for their own troops. Some worked as laboratory men in hospitals in non-commissioned grades.

Dentists were expected to help doctors in case of grave emergency, but such use was rare and dentists generally did only dental work. They did not do non-professional duties.

Replacement of teeth was authorized for any tooth lost in combat or as a result of duties as a soldier. Officers and non-commissioned officers received replacements necessary to speech. Others were supposed to receive replacements when less than four contacting teeth remained above and below. They were also to receive replacements if all anteriors or all posteriors were missing but this was often impossible and it was stated that no attempt was made to replace teeth for "peasants" who the dentist believed would not wear an appliance even if supplied with one.

All troops were examined once yearly with a mirror in a chair. Cavities and other required work were listed on a chart which was returned to the battalion surgeon. Patients were sent in by the battalion surgeon when occasion offered. (This provision would seem to apply to hospital practice only.) A monthly report was rendered on the amount of work done, but no report on the condition of the command was made except optionally under remarks.

Patients could not refuse treatment of conditions which affected their military efficiency.

The persons interrogated could not estimate the number of fillings placed per dentist beyond saying "viele hundert" (many hundred) per month.

No central dental laboratories were available, all prosthetic work being accomplished at hospitals. Nothing was known of any mobile laboratories. There were many mobile operating trucks, but they were used only in Russia. (One such truck has been previously reported in Pilsen, Czechoslovakia.)

#### MAXILLO-FACIAL Surgery.

Maxillo-facial cases received air evacuation with high priority. Special hospitals were established in Russia for the big offensives. First aid bandages were applied in the field. Wire arch bands were applied in Feldlazarets (Field Hospitals); splinting was usually done at maxillo-facial hospitals.

Immediate closure of facial wounds was practiced if cases were new (24 hours). If older, or badly contaminated, they were left open for several days. Drains of rubber dam, either through and through or at one end of wound, were always used on closure, whether old or new. A rubber dam drain which tended to remain in the wound was made by cutting a one-quarter inch hole, three fourths inch from one end of a strip of dam three-fourths inch by two and one-half ( $2\frac{1}{2}$ ) inches.

The short end was then doubled back through the hole, making a constriction there with a flare out toward the short end.

Sulfa drugs were always used locally as a light dusting, and were used internally only in cases of developed infection. Two to four grams were given as a start, with one gram every four hours day and night for three or four days. In case of severe infection, sulfa drugs were given intravenously or intramuscularly. Tetanus antitoxin was given routinely at the beginning of treatment. Both grafts from ileum and osteo-periosteal grafts from tibia were used. Setting of maxillary fractures were done by dentists, bone grafts by surgeons, and plastic procedures by either.

Debridement was either conservative or radical. Radical debridement was used if the wound was badly contaminated or old.

Fractures were treated by wiring occasionally, but generally by acrylic splints, usually without fixation to the upper in case of mandibular fractures. External fixation is used very rarely, not at all at this hospital. (No use of external fixation by pins has yet been seen in German hospitals, though the method is known and reported used occasionally.)

#### MILITARY TRAINING

The German Army had no field school for dentists. Special oral surgical courses were given in civilian schools, varying from a week to a month in length. Such courses offered little opportunity for the student to work. It is reported that such schools were at Düsseldorf and Würzburg. Others probably existed.

#### VINCENT'S INFECTION

As is generally the case, it was stated that there were very few cases of Vincent's infection (Plaut-Vincent's Angina) among German soldiers. It was further stated that there was a lower incidence among the German military than among civilians. (This statement does not agree with that of American dentists treating German prisoners who claim a high incidence of sub-acute Vincent's infection. It seems probable that sub-acute Vincent's infections were routinely diagnosed, on clinical grounds only, as gingivitis.) The few cases seen were usually reported in the late spring and late autumn. Cases were not quarantined, but were cautioned about exchange of eating utensils or cigarettes. Vincent's infection is not considered highly contagious nor an important military disease. (NOTE: The above information is reported as obtained. It does not always agree with that previously reported. It must be recognized that official records are nearly non-existent, and information obtained is no more reliable than the individual giving it.)

Information on the practice of Maxillo-facial surgery in Germany and Austria was obtained in an interview with Dr. Arnold Aichinger at Gmunden, Austria. Prof. Dr. Aichinger was assistant to Dr. Fichler of the University of Vienna in the Abteilung für Gesichts- und Kieferchirurgie (Wiederherstellungshirurgie). At the outbreak of war, Dr. Aichinger was taken into the army as chief surgeon to the maxillo-facial hospital in Vienna, which served Wehrkreise 17 & 18, comprising most of Austria. He was chief of this 360 bed hospital until the arrival of the Russians, when he, his staff, and as many patients as could be moved were brought to Gmunden in Western Austria. At the present time this hospital has 100 cases under treatment, most requiring plastic repairs. Professor Fichler is believed to be in the Tyrol, but this is uncertain.

Plastic practice at this hospital seemed much like that of American operators. The following points were noted in examining cases:

Flaps of mucous membrane, about  $1\frac{1}{2}$  mm thick, thicker at the pedicle, are used within the mouth for minor repairs, as for the creation of a sulcus between mandible and lip.

Sulci between mandible and lip are also created without grafts merely by placing a stent covered with iodoform gauze until epithelialization takes place. Thiersch grafts have been used, but are not liked in the mouth because of the frequency with which they have been lost.

Palates are recreated using a bone graft from the curved lower tip of the scapula. This graft is first buried in the abdomen, and later raised and the edges of skin folded under the bone to cover both sides. When transferred to the mouth as a pedicle graft after a preliminary transplant to the arm, the bone is covered with soft tissue so that contact with saliva is minimal.

Depressed fractures of the body of the zygoma are raised by inserting a strong hook, after trigeminal nerve block, between the eye and the bone at the floor of the orbit and into the inferior orbital fissure. After reduction by outward manual tension, the case is immobilized by headcap and a wire making a loop around the zygoma and through the inferior orbital fissure. In cases of severe comminution a Caldwell-Luc operation is done and the sinus packed with iodoform gauze which is left ten days.

Eye lashes are replaced with narrow free grafts from the edge of the hair line of the neck. These are not always successful, however.

The bony floor of the orbit is replaced by a free graft from the scapula.

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Bone grafts for the jaw are usually made as a sliding graft from the largest remaining section of bone if at all possible. Fragments are first immobilized with a plastic splint, the horizontal segment freed for the graft is moved to position, and wired directly with stainless steel. If remaining segments of the mandible are too small for this purpose, a graft is taken from the crest of the ilium. Osteo-periosteal grafts from the tibia are used for replacing the bridge of the nose, but are not used for jaw work. Rib grafts are not used.

Flaps for the face are taken from as near the area to be filled in as possible. For example, upper lips are created from flaps taken from alongside the alae of the nose.

Cartilage is not used to replace chins. Fat is used, stated to come from facial area (where obtained not definite.) From actual inspection of cases, it is believed that very little building out of chins, beyond uniting fragments with bone-graft, is practiced.

In the facial area flaps for plastic operations are raised two to three weeks before the final operation, and are immediately sutured in place again as a measure to increase the blood supply through the pedicle.

Acrylic eyes are used only as pink acrylic inserts to retain space pending insertion of a permanent glass eye.

Dr. Aichinger mentioned a book on war surgery and medicine (*Kriegschirurgie und Kriegsmedizin*) in three volumes printed by Deuticke in Vienna. This work was a symposium on war surgery and medicine by specialists of the Vienna School and was said to be widely distributed in the army. Jaw surgery was limited to a small section in the first volume, by Dr. Aichinger.

General Stabsarzt Alfred Zimmer was Surgeon for upper and lower Austria and Vienna during the war, and until February 1945, when the Russians arrived in Vienna. He is thought to be a prisoner in Vienna, though still carrying on his work. He was succeeded by General Stabsarzt Hennberg, who was not from the University of Vienna group, and who now has his headquarters in Gmunden, where he cooperates with the American military in operating the many German hospitals in the area.

Dr. Aichinger says that there were in Germany ten maxillo-facial hospitals as follows: (Name of principal surgeon given when known.)

Berlin (Z)	Drs. Oxhausen and Wasmund
Vienna	Dr. Aichinger
Dusseldorf	Dr. Lindemann
Munchen	---
Breslau	(bombed out)
Dresden	Dr. Pervitschky
	---

Frankfort

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Hamburg

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Kolberg

Dr. Schlampp

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Drs. Asmund and Pervitschky were reported in or near Wurzburg two months ago.

The University of Vienna was almost completely destroyed during the war, but according to latest information the dental school and clinic were intact.

#### IV. Oral Surgery.

The subject of oral surgery in Germany and Austria was discussed with Dr. Hofreiter, at Gmunden, Austria. Dr. Hofreiter was assistant in the Wien Poliklinik, associated with the University of Vienna, in general surgery from 1926 to 1930. From 1930 to 1938 he was assistant to Prof. Dr. Pichler, chief of the maxillo-facial section of the same clinic. He entered the Army in 1939, continued his work and remained in Vienna doing military maxillo-facial work till arrival of the Russians. At present he is principal maxillo-facial surgeon in the Cumberland Hospital for German POW's at Gmunden. At present he has 160 jaw cases.

Some points discussed with Dr. Hofreiter are as follows:

Policy at this hospital regarding debridement is much like our own. All possible skin and bone are conserved. Actually there was seldom opportunity to do debridement at the center as it was usually performed at the Feldlazarett before evacuation.

New, clean wounds, without excessive bone involvement, were closed immediately with rubber drains left in place. Most wounds seen here were several days old when received. Primary closure was seldom done at the field hospitals. Thus most wounds were left open for a week or ten days before closure. When finally closed, the edges were roughly approximated with lead buttons and stainless steel tension sutures. No smaller sutures were used to draw skin edges into close approximation.

Sulfa drugs were not used prophylactically in jaw surgery. If a severe infection developed, the patient was put on a schedule of decreasing dosage (12 grams the first day, 10 grams the second day, 8 grams the third day etc.) If infection was less severe, four to six grams, decreasing as above, were given daily.

Whenever possible bone grafts were of the "sliding" type from the larger remaining fragment of the mandible, wired in place with steel wire. This type of graft was done as soon as healing of the

soft parts was complete. Free grafts were from the crest of the ileum and were delayed until at least six months after healing was complete. Osteoperiosteal grafts were used for the bridge of the nose, but not for mandibular work. Rib grafts were not used. Grafts from the ileum were sometimes imbedded in an area later to be used for pedicle graft and thus had blood supply from the pedicle when finally moved with the soft tissue to its final location.

Most fixation of bone fragments is done with acrylic splints. These splints are hinged at the heels and the labial half is cut at the midline in front so that the facial sections may be swung laterally for insertion. When inserted the two facial sections are again approximated at the midline and fastened with a screw. Impressions are usually taken with plaster but the natural undercuts of the teeth are not relied on for retention of the splint. Before taking the impression stainless steel bands are adapted to several sound teeth and a "tit" of solder is added to the band. This projection on the band appears as a depression in the finished splint. The bands are cemented to the teeth, and when the splint is applied over the bands the projections on the bands fit into the depressions in the splint and prevent its removal. This modification seems to be made necessary by poor impression technique.

Headcaps were used when necessary to provide backward tension to a ramus or support for a maxilla or for fractured nasal bones. Headcaps were in general very simple, with support provided through heavy wires which were bent to desired form.

Extra-oral fixation with pins was reported used occasionally in civil practice, but was not used at all for military patients. It was not very well liked.

Circumferential wiring is occasionally done in edentulous cases, but a splint with bandage support is preferred.

Direct bone plating is seldom done around the face. It is especially undesirable when plastic procedures are to follow.

Flaps for facial repairs were taken from a horizontal area on the neck just below the larynx or, if larger flaps were required, from the horizontal area lying just below the clavicle. The older method of taking vertical flaps from the chest inside the nipple-line has been abandoned here. It is believed tissue obtained is more like that of face. Abdominal flaps not used as widely as in Dr. Aichinger's hospital.

In this hospital the Thiersch graft is widely used to form a vestibule for the mouth.

Impacted zygomas are brought out with heavy elevators used intraorally. Great faith was shown in iodoform gauze. Comminuted

fractures of the zygoma are packed out with iodoform gauze and left ten days. If plain gauze is used, it is left only four days and is then replaced. No iodoform is at present available.

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